Substitute Sequence Listing

<110>   DE VRIES, Erik
         GAFFAR, Fasilla Razzia
         YATSUDA, Ana Patricia
         SCHAAP, Theodorus Cornelis

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ttt gcg gaa gat gct tta gct tcc aac tcc acg ctt ttc gct ttc cac   144
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ttg ctc aac tca agg agg ggt tcg gat gat gcg tcc gaa tct tcc gat   240
Leu Leu Asn Ser Arg Arg Gly Ser Asp Asp Ala Ser Glu Ser Ser Asp
65   70   75   80

aga tac cca ggt agg tcg ggt ggc tct aag aat tcg agc caa tcc ccc   288
Arg Tyr Pro Gly Arg Ser Gly Gly Ser Lys Asn Ser Ser Gln Ser Pro
                85   90   95

tgg atc aag tat atg caa aag ttc gac att ccc cgt aac cac ggc tct   336
Trp Ile Lys Tyr Met Gln Lys Phe Asp Ile Pro Arg Asn His Gly Ser
            100   105   110

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Gly Ile Tyr Val Asp Leu Gly Gly Tyr Glu Ser Val Gly Ser Lys Ser
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tat cgt atg ccc gtt ggt aag tgc cca gta gtc ggt aaa att ata gac       432
Tyr Arg Met Pro Val Gly Lys Cys Pro Val Val Gly Lys Ile Ile Asp
    130                 135                 140

ctt gga aat ggt gcc gac ttc ctc gat ccc att tca tca gac gac cca       480
Leu Gly Asn Gly Ala Asp Phe Leu Asp Pro Ile Ser Ser Asp Asp Pro
145                 150                 155                 160

agt tac cgt ggt ttg gca ttc ccc gag act gct gtg gac tct aat att       528
Ser Tyr Arg Gly Leu Ala Phe Pro Glu Thr Ala Val Asp Ser Asn Ile
                165                 170                 175

ccc aca caa cca aag aca cgt ggt tct tca tca gca tct gcg gcc aaa       576
Pro Thr Gln Pro Lys Thr Arg Gly Ser Ser Ser Ala Ser Ala Ala Lys
                180                 185                 190

tta tct cct gtt tcg gcg aaa gat ctg aga cgt tgg gga tat gaa ggt       624
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Leu Leu Cys Met Lys Pro Tyr Lys Ser Ala Glu Asp Ala His Leu Tyr
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aca cct aac tgc ttg atc ttg aac gcg gga agc att gct ctc acg gct   1296
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                    420   425   430

ata ggt tca cct ctc gag tat gac gct gtt aac tat cct tgc cac atc   1344
Ile Gly Ser Pro Leu Glu Tyr Asp Ala Val Asn Tyr Pro Cys His Ile
                    435   440   445

gac acc aat ggt tac gtt gag cca cgt gca aag aat acc aac aaa tac   1392
Asp Thr Asn Gly Tyr Val Glu Pro Arg Ala Lys Asn Thr Asn Lys Tyr
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ctt gat gtt cct ttc gag gtc aca act gct ttg agc atg aag aca cta   1440
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aaa tgc gat gcc tat gtt cac acc aag tac tct gac agt tgt ggt acc   1488
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                    485   490   495

tat ttc ctt tgc tca gac gtc aaa cct aac tgg ttc att agg ttc tta   1536
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cac atg atc gga ctc tac aac aca aag cgt atc gta ata ttc gtg tgc   1584
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                    515   520   525

tgt acc act acc gcc atc gtt ctc act atc tgg ata tgg aaa cga ttc   1632
Cys Thr Thr Thr Ala Ile Val Leu Thr Ile Trp Ile Trp Lys Arg Phe
          530   535   540

atc aag gct aag aaa gag ccg gcc cct cca agt ttc gac aaa tac cta   1680
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cag cgt ttg gat tcc tct gct tat agc tgg gga gag gct gta caa aga   1776
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                    580   585   590

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Phe Ala Glu Asp Ala Leu Ala Ser Asn Ser Thr Leu Phe Ala Phe His
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Trp Ile Lys Tyr Met Gln Lys Phe Asp Ile Pro Arg Asn His Gly Ser
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Ser Tyr Arg Gly Leu Ala Phe Pro Glu Thr Ala Val Asp Ser Asn Ile
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            195   200   205

Asn Asp Val Ala Asn Cys Ser Glu Tyr Ala Ser Asn Leu Ile Pro Ala
    210   215   220

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Ser Asp Arg Ser Thr Lys Tyr Arg Tyr Pro Phe Val Phe Asp Ser Asp
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Asn Gln Met Cys Tyr Ile Leu Tyr Ser Ala Ile Gln Tyr Asn Gln Gly
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            340   345   350

Ala Val Asn Glu Asp Phe Asn Glu Leu Lys Glu Leu Thr Asp Gly Leu
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Lys Arg Leu Asn Met Ser Lys Val Ala Asn Ala Ile Phe Ser Pro Leu
    370   375   380

Ser Asn Val Ala Gly Thr Ser Arg Ile Ser Arg Gly Val Gly Met Asn
385   390   395   400

Trp Ala Thr Tyr Asp Lys Asp Ser Gly Met Cys Ala Leu Ile Asn Glu
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Thr Pro Asn Cys Leu Ile Leu Asn Ala Gly Ser Ile Ala Leu Thr Ala
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Ile Gly Ser Pro Leu Glu Tyr Asp Ala Val Asn Tyr Pro Cys His Ile
    435   440   445

Asp Thr Asn Gly Tyr Val Glu Pro Arg Ala Lys Asn Thr Asn Lys Tyr
    450   455   460

Leu Asp Val Pro Phe Glu Val Thr Thr Ala Leu Ser Met Lys Thr Leu
465   470   475   480

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Lys Cys Asp Ala Tyr Val His Thr Lys Tyr Ser Asp Ser Cys Gly Thr
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Tyr Phe Leu Cys Ser Asp Val Lys Pro Asn Trp Phe Ile Arg Phe Leu
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His Met Ile Gly Leu Tyr Asn Thr Lys Arg Ile Val Ile Phe Val Cys
            515             520             525


Cys Thr Thr Thr Ala Ile Val Leu Thr Ile Trp Ile Trp Lys Arg Phe
            530             535             540


Ile Lys Ala Lys Lys Glu Pro Ala Pro Pro Ser Phe Asp Lys Tyr Leu
545             550             555             560


Ser Asn Tyr Asp Tyr Asp Thr Thr Leu Asp Ala Asp Asn Glu Thr Glu
            565             570             575


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cct gtg tta gga agc aac tct gac cct tcg gaa gag tat gat tca ttc        96
Pro Val Leu Gly Ser Asn Ser Asp Pro Ser Glu Glu Tyr Asp Ser Phe
            20              25              30

cag caa aat gtt ttc act cat caa cca acc caa cta cac aaa tct cat       144
Gln Gln Asn Val Phe Thr His Gln Pro Thr Gln Leu His Lys Ser His
        35              40              45

cac tac att aca cac cag aaa aaa acc agc caa cac atc gac gat tta       192
His Tyr Ile Thr His Gln Lys Lys Thr Ser Gln His Ile Asp Asp Leu
        50              55              60

aat ttt tat aat gga aaa ttt aat caa aag agc aga att ggt cca ggg       240
Asn Phe Tyr Asn Gly Lys Phe Asn Gln Lys Ser Arg Ile Gly Pro Gly
65              70              75              80
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aag gat gac aat aaa aca aaa tct aaa ata aag tca aaa aca gca tca        336
Lys Asp Asp Asn Lys Thr Lys Ser Lys Ile Lys Ser Lys Thr Ala Ser
            100                 105                 110

att tta cct aga ctt tta aaa tct tta tca ttt tta gct gtt tta ggg        384
Ile Leu Pro Arg Leu Leu Lys Ser Leu Ser Phe Leu Ala Val Leu Gly
            115                 120                 125

tca att aat tca ttt tca tta gca tta gag gaa cct ttt act caa cac        432
Ser Ile Asn Ser Phe Ser Leu Ala Leu Glu Glu Pro Phe Thr Gln His
            130                 135                 140

act tct aac cga acg ccc ttt gaa gta tca tta att caa agc aac agc        480
Thr Ser Asn Arg Thr Pro Phe Glu Val Ser Leu Ile Gln Ser Asn Ser
145                 150                 155                 160

agt tta tcg cct att cat aat tct tca act caa aat tca agt cat cac        528
Ser Leu Ser Pro Ile His Asn Ser Ser Thr Gln Asn Ser Ser His His
            165                 170                 175

aac ggt ttt agt ggt agt acc gtt aat aat acc tca tta ata gag aca        576
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            180                 185                 190

agg aat aac gta tta aac aga aca cta ggt aga ttc gga tca ttt ttg        624
Arg Asn Asn Val Leu Asn Arg Thr Leu Gly Arg Phe Gly Ser Phe Leu
            195                 200                 205

caa tca gga ttg ata agc agt aga gca gac aaa aag aag cgg tct ggt        672
Gln Ser Gly Leu Ile Ser Ser Arg Ala Asp Lys Lys Lys Arg Ser Gly
210                 215                 220

atg aat aga aga ggc cct aag ggg aag aaa ggg aag gga gga gaa gac        720
Met Asn Arg Arg Gly Pro Lys Gly Lys Lys Gly Lys Gly Gly Glu Asp
225                 230                 235                 240

gaa gaa aag agg aac aag tgg acc gat ttc atg gca aag ttt gat atc        768
Glu Glu Lys Arg Asn Lys Trp Thr Asp Phe Met Ala Lys Phe Asp Ile
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gct aag gtc cac ggt tca ggg gtt tac gta gat ttg ggt gaa tct gcc        816
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            260                 265                 270

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Thr Val Gly Ser Tyr Asp Tyr Arg Met Pro Ile Gly Lys Cys Pro Val
            275                 280                 285

gta ggt aag gca atc ata ctc gag aat gga gct gat ttt ttg agc agc        912
Val Gly Lys Ala Ile Ile Leu Glu Asn Gly Ala Asp Phe Leu Ser Ser
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Ile Thr His His Asp Pro Lys Glu Arg Gly Leu Gly Phe Pro Ala Thr
305                 310                 315                 320

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        355                 360                 365

agt aat cgt aat tca aag tat cgt tac ccg ttt gta tat gat gag tct    1152
Ser Asn Arg Asn Ser Lys Tyr Arg Tyr Pro Phe Val Tyr Asp Glu Ser
370                 375                 380

gag aag ctt tgt tat att tta tat agt ccc atg caa tat aat cag ggc    1200
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gta aag tac tgt gac caa gac tct ccg gac gaa gga act agc agt tta    1248
Val Lys Tyr Cys Asp Gln Asp Ser Pro Asp Glu Gly Thr Ser Ser Leu
            405                 410                 415

gct tgt atg tac ccg gat aag agc aag gag gat tca cac cta ttt tac    1296
Ala Cys Met Tyr Pro Asp Lys Ser Lys Glu Asp Ser His Leu Phe Tyr
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gga acc agc ggt ctt cac atg gac tgg cct gta gtt tgc cca gtt tac    1344
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cct att aga gat tcg att ttt gga tcc tac gac gac caa aag gac gaa    1392
Pro Ile Arg Asp Ser Ile Phe Gly Ser Tyr Asp Asp Gln Lys Asp Glu
    450                 455                 460

tgt gtt cca att gag ccg ata ttt gag gag gag gct gaa gat tat gag    1440
Cys Val Pro Ile Glu Pro Ile Phe Glu Glu Glu Ala Glu Asp Tyr Glu
465                 470                 475                 480

gca tgt gcc aag ata att ttc gag tat tct cca agt gat gtt gat att    1488
Ala Cys Ala Lys Ile Ile Phe Glu Tyr Ser Pro Ser Asp Val Asp Ile
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        515                 520                 525

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530                 535                 540

tgg gct aca tac tcc gtc gag gaa aag aaa tgt aac att ctc gac gtt    1680
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545                 550                 555                 560

gtt ccc agc tgt ctt att ata agt aac ggc cac tat gcc ctt aca agt    1728
Val Pro Ser Cys Leu Ile Ile Ser Asn Gly His Tyr Ala Leu Thr Ser
                565                 570                 575

ctc agc tca ccc aat gaa gag gat gct ata aat tac ccc tgc gat atc    1776
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Val Gln Gly Lys Gly Phe Leu Lys Asn Pro Asn Gly Gly Lys Lys Asn
            595                 600                 605

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Ala Gln Glu Pro Pro Lys Glu Pro Glu Pro Glu Glu Pro Lys Lys Glu
    610                 615                 620

ggt gct gaa aac aaa ccc aaa gag aaa ggt aaa tct gag aaa aag aat      1920
Gly Ala Glu Asn Lys Pro Lys Glu Lys Gly Lys Ser Glu Lys Lys Asn
625                 630                 635                 640

gaa aaa tct atg cct tca gga cca ttc acg cca tac act agc ttg aag      1968
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                645                 650                 655

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705                 710                 715                 720

cac ttg aaa aaa cac aat tcc cag ata tat gaa gat gat aac gtg aac      2208
His Leu Lys Lys His Asn Ser Gln Ile Tyr Glu Asp Asp Asn Val Asn
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                740                 745                 750

gct tcg aat gtt aga ggt gat caa atc tgg agc aga cac act cca gac      2304
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        755                 760                 765

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            100   105   110

Ile Leu Pro Arg Leu Leu Lys Ser Leu Ser Phe Leu Ala Val Leu Gly
        115   120   125

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145   150   155   160

Ser Leu Ser Pro Ile His Asn Ser Ser Thr Gln Asn Ser Ser His His
            165   170   175

Asn Gly Phe Ser Gly Ser Thr Val Asn Asn Thr Ser Leu Ile Glu Thr
            180   185   190

Arg Asn Asn Val Leu Asn Arg Thr Leu Gly Arg Phe Gly Ser Phe Leu
        195   200   205

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210   215   220

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Glu Glu Lys Arg Asn Lys Trp Thr Asp Phe Met Ala Lys Phe Asp Ile
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            260   265   270

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Val Gly Lys Ala Ile Ile Leu Glu Asn Gly Ala Asp Phe Leu Ser Ser
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        355   360   365

Ser Asn Arg Asn Ser Lys Tyr Arg Tyr Pro Phe Val Tyr Asp Glu Ser
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Gly Thr Ser Gly Leu His Met Asp Trp Pro Val Val Cys Pro Val Tyr
        435   440   445

Pro Ile Arg Asp Ser Ile Phe Gly Ser Tyr Asp Asp Gln Lys Asp Glu
    450   455   460

Cys Val Pro Ile Glu Pro Ile Phe Glu Glu Glu Ala Glu Asp Tyr Glu
465   470   475   480

Ala Cys Ala Lys Ile Ile Phe Glu Tyr Ser Pro Ser Asp Val Asp Ile
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Ser Thr Asn Asn Gln Lys Leu Ser Asp Val Asp Leu Tyr Lys Glu Ala
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Arg Tyr Ser Glu Asp Arg Pro Ile Tyr Thr Lys Gly Val Gly Ile Asn
    530   535   540

Trp Ala Thr Tyr Ser Val Glu Glu Lys Lys Cys Asn Ile Leu Asp Val
545   550   555   560

Val Pro Ser Cys Leu Ile Ile Ser Asn Gly His Tyr Ala Leu Thr Ser
           565   570   575

Leu Ser Ser Pro Asn Glu Glu Asp Ala Ile Asn Tyr Pro Cys Asp Ile
          580   585   590

Val Gln Gly Lys Gly Phe Leu Lys Asn Pro Asn Gly Gly Lys Lys Asn
    595   600   605

Ala Gln Glu Pro Pro Lys Glu Pro Glu Pro Glu Glu Pro Lys Lys Glu
  610   615   620

Gly Ala Glu Asn Lys Pro Lys Glu Lys Gly Lys Ser Glu Lys Lys Asn
625   630   635   640

Glu Lys Ser Met Pro Ser Gly Pro Phe Thr Pro Tyr Thr Ser Leu Lys
          645   650   655

Lys Glu Gly Phe Glu Cys Ser Lys Tyr Thr Val Glu Arg Val Asn Lys
        660   665   670

Ser Cys Gly Val Tyr Tyr Glu Cys Ser Glu Thr Pro Val Leu Phe Thr
       675   680   685

Lys Lys Asn Arg Ile Tyr Leu Tyr Ile Ile Leu Ala Val Ser Leu Val
    690   695   700

Val Leu Ala Val Leu Ala Tyr Phe Gly Tyr Arg Tyr Tyr Ser Lys Asn
705   710   715   720

His Leu Lys Lys His Asn Ser Gln Ile Tyr Glu Asp Asp Asn Val Asn
        725   730   735

Asn Tyr Tyr Asn Glu Asp Phe Asp Asp Glu Gln Asp Arg Asp Glu Tyr
        740   745   750

Ala Ser Asn Val Arg Gly Asp Gln Ile Trp Ser Arg His Thr Pro Asp
    755   760   765

Arg Ser Glu Val Thr Pro Val Arg Ile Ser Arg Leu Asn His

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<212> DNA
<213> Babesia bovis

<220>
<221> CDS
<222> (1)..(1968)

<400> 5

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atg atc ggt tac atc aag att ctg gcc tct gtg ccc ctg tta agt tta      48
Met Ile Gly Tyr Ile Lys Ile Leu Ala Ser Val Pro Leu Leu Ser Leu
1               5                   10                  15

gcc ttt tta gct aca acg ggg ata cat gct ttt gcg gac aaa ggt att      96
Ala Phe Leu Ala Thr Thr Gly Ile His Ala Phe Ala Asp Lys Gly Ile
                20                  25                  30

ggt tca cca aag ggg aaa caa tgc aag aag caa ctt gac ttt tcg att     144
Gly Ser Pro Lys Gly Lys Gln Cys Lys Lys Gln Leu Asp Phe Ser Ile
            35                  40                  45

gtg gta gat gaa tct gct agt ata tcg gat gat caa tgg gag ggt cag     192
Val Val Asp Glu Ser Ala Ser Ile Ser Asp Asp Gln Trp Glu Gly Gln
        50                  55                  60

atg att cca ttt ttg agg aat ttg att cat acc gtt gac ctt gac aac     240
Met Ile Pro Phe Leu Arg Asn Leu Ile His Thr Val Asp Leu Asp Asn
65                  70                  75                  80

act gac ata cgt ctt tcg ctt acc act tac tca act cca act cgc cag     288
Thr Asp Ile Arg Leu Ser Leu Thr Thr Tyr Ser Thr Pro Thr Arg Gln
                85                  90                  95

ata ttt acg ttt ttg gat gct gct gca agc agt acc agg ctc gca ctc     336
Ile Phe Thr Phe Leu Asp Ala Ala Ala Ser Ser Thr Arg Leu Ala Leu
                100                 105                 110

acg aaa ctt gat tgg atg aac ggt acc aaa gct agg tat ggt atg acc     384
Thr Lys Leu Asp Trp Met Asn Gly Thr Lys Ala Arg Tyr Gly Met Thr
            115                 120                 125

tac act ggc agg gct ctg aac tac gtt cgt aag gct ata cta cca tat     432
Tyr Thr Gly Arg Ala Leu Asn Tyr Val Arg Lys Ala Ile Leu Pro Tyr
        130                 135                 140

ggt cgc aag aat gta ccc aag gca ctg tta ctg atc act gat gga gta     480
Gly Arg Lys Asn Val Pro Lys Ala Leu Leu Leu Ile Thr Asp Gly Val
145                 150                 155                 160

tct tcg gat gga agt tac act gca cag gtt gcg gct atg ctt cgt gat     528
Ser Ser Asp Gly Ser Tyr Thr Ala Gln Val Ala Ala Met Leu Arg Asp
                165                 170                 175

gaa ggt gta aat gta atg gtt att ggt gtc ggt gat gta aat gtt gct     576
Glu Gly Val Asn Val Met Val Ile Gly Val Gly Asp Val Asn Val Ala
                180                 185                 190

gaa tgc cgt ggc ata gta gga tgt gat gga ata atg gat tgt cct atg     624
```

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```
Glu Cys Arg Gly Ile Val Gly Cys Asp Gly Ile Met Asp Cys Pro Met
        195             200             205

ttc aag cag acc aac tgg aag gat atc atg ggc ctc ttt aac agt tta    672
Phe Lys Gln Thr Asn Trp Lys Asp Ile Met Gly Leu Phe Asn Ser Leu
    210             215             220

atg aag gag gta tgt gat att tta cct cag gac gct gtt tgt gag cct    720
Met Lys Glu Val Cys Asp Ile Leu Pro Gln Asp Ala Val Cys Glu Pro
225             230             235             240

gta tgg gca gaa tgg tca tct tgt aac ggg gaa tgt ggc gtt cct ggt    768
Val Trp Ala Glu Trp Ser Ser Cys Asn Gly Glu Cys Gly Val Pro Gly
            245             250             255

aaa cga act cgt gct ctt ttg gac ctc cga atg att gaa aag ccc gta    816
Lys Arg Thr Arg Ala Leu Leu Asp Leu Arg Met Ile Glu Lys Pro Val
            260             265             270

aat ggc tcg aat gga caa ccg ggt aaa tca tgt gag gat cag aag atg    864
Asn Gly Ser Asn Gly Gln Pro Gly Lys Ser Cys Glu Asp Gln Lys Met
            275             280             285

aac ttc tta ccc caa tca gag aca tgc acc ata gaa tgc aat cat gag    912
Asn Phe Leu Pro Gln Ser Glu Thr Cys Thr Ile Glu Cys Asn His Glu
    290             295             300

cct gtg cca agc tcg ccg gaa cct gta tca gat gat atg gat cac cca    960
Pro Val Pro Ser Ser Pro Glu Pro Val Ser Asp Asp Met Asp His Pro
305             310             315             320

gaa cca act cct gtt aca ccg gaa ggt gac atg gat aaa tct cat tcc   1008
Glu Pro Thr Pro Val Thr Pro Glu Gly Asp Met Asp Lys Ser His Ser
            325             330             335

cat tcg agc att cca tcc acc cct gat atg cca tca agt cac agt gat   1056
His Ser Ser Ile Pro Ser Thr Pro Asp Met Pro Ser Ser His Ser Asp
            340             345             350

atg tca tca agc cct act gat atg tca tca agc cct act gac atg tca   1104
Met Ser Ser Ser Pro Thr Asp Met Ser Ser Ser Pro Thr Asp Met Ser
            355             360             365

tca agc cct act gac atg tca tca agt cac agt gac atg cca tca act   1152
Ser Ser Pro Thr Asp Met Ser Ser Ser His Ser Asp Met Pro Ser Thr
            370             375             380

cct act ggc atg tca tca agt cac agt gat atg cca tca agt cac agt   1200
Pro Thr Gly Met Ser Ser Ser His Ser Asp Met Pro Ser Ser His Ser
385             390             395             400

gat atg cca tca agc cac agt gat atg tca tca agc cct act gac atg   1248
Asp Met Pro Ser Ser His Ser Asp Met Ser Ser Ser Pro Thr Asp Met
            405             410             415

tca tca agt cac gct gat act cgt gta gga aat acc gat gaa gaa cat   1296
Ser Ser Ser His Ala Asp Thr Arg Val Gly Asn Thr Asp Glu Glu His
            420             425             430

aac cac agg aaa gat atg gat gtc aag ttc ccc gaa aat atg gat gat   1344
Asn His Arg Lys Asp Met Asp Val Lys Phe Pro Glu Asn Met Asp Asp
            435             440             445
```

```
atc cca gtc gag gat aat cct ata ccc aca gat cct aga cat ggc gtc      1392
Ile Pro Val Glu Asp Asn Pro Ile Pro Thr Asp Pro Arg His Gly Val
    450                 455                 460

gaa cca tcg cct tct gat gtg atc cct gag gat gac caa ctt cgt agg      1440
Glu Pro Ser Pro Ser Asp Val Ile Pro Glu Asp Asp Gln Leu Arg Arg
465                 470                 475                 480

acg ctt gaa atg cag cgc gaa gag gac cta aag aag gaa ttg atg ctc      1488
Thr Leu Glu Met Gln Arg Glu Glu Asp Leu Lys Lys Glu Leu Met Leu
                485                 490                 495

caa cat gaa ctg aag ctt cag gaa gaa aag gaa agg gca gct att tta      1536
Gln His Glu Leu Lys Leu Gln Glu Glu Lys Glu Arg Ala Ala Ile Leu
                500                 505                 510

gag aat aac act cct tat gga tcc gcc act tcc gtg tcg caa gac ggt      1584
Glu Asn Asn Thr Pro Tyr Gly Ser Ala Thr Ser Val Ser Gln Asp Gly
            515                 520                 525

gaa tct cca act ggc gta ccc caa agt agc gag acc gat gca ata cgt      1632
Glu Ser Pro Thr Gly Val Pro Gln Ser Ser Glu Thr Asp Ala Ile Arg
    530                 535                 540

cac gag gtg tat gac gat cac ccc gag gaa tct gaa aac acc ggg att      1680
His Glu Val Tyr Asp Asp His Pro Glu Glu Ser Glu Asn Thr Gly Ile
545                 550                 555                 560

aat gct gat gtg acc gaa tct gag gac tat gag ggt gaa aaa caa aag      1728
Asn Ala Asp Val Thr Glu Ser Glu Asp Tyr Glu Gly Glu Lys Gln Lys
                565                 570                 575

gac gaa tca aat gaa cgt tcg acc agc aac act act aag att gcc ggc      1776
Asp Glu Ser Asn Glu Arg Ser Thr Ser Asn Thr Thr Lys Ile Ala Gly
                580                 585                 590

ggt gct cta cta ggt ctt ctt ctc ctt ggt gcc ggt ggt gga tac gct      1824
Gly Ala Leu Leu Gly Leu Leu Leu Leu Gly Ala Gly Gly Gly Tyr Ala
            595                 600                 605

atg tac aaa aag aac aag aca cct act gtt gag aca ggt tca ggt gat      1872
Met Tyr Lys Lys Asn Lys Thr Pro Thr Val Glu Thr Gly Ser Gly Asp
    610                 615                 620

tac act ggg gcc gac gag agt tca gaa ccc atg aag gag ggt gac aca      1920
Tyr Thr Gly Ala Asp Glu Ser Ser Glu Pro Met Lys Glu Gly Asp Thr
625                 630                 635                 640

tac acc gtc act gag ttt gac aac aac att tgg ggc gag gca gcg taa      1968
Tyr Thr Val Thr Glu Phe Asp Asn Asn Ile Trp Gly Glu Ala Ala
                645                 650                 655
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<210> 6
<211> 655
<212> PRT
<213> Babesia bovis

<400> 6

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Met Ile Gly Tyr Ile Lys Ile Leu Ala Ser Val Pro Leu Leu Ser Leu
1               5                   10                  15
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Ala Phe Leu Ala Thr Thr Gly Ile His Ala Phe Ala Asp Lys Gly Ile
            20   25   30

Gly Ser Pro Lys Gly Lys Gln Cys Lys Lys Gln Leu Asp Phe Ser Ile
        35   40   45

Val Val Asp Glu Ser Ala Ser Ile Ser Asp Asp Gln Trp Glu Gly Gln
    50   55   60

Met Ile Pro Phe Leu Arg Asn Leu Ile His Thr Val Asp Leu Asp Asn
65   70   75   80

Thr Asp Ile Arg Leu Ser Leu Thr Thr Tyr Ser Thr Pro Thr Arg Gln
            85   90   95

Ile Phe Thr Phe Leu Asp Ala Ala Ala Ser Ser Thr Arg Leu Ala Leu
            100   105   110

Thr Lys Leu Asp Trp Met Asn Gly Thr Lys Ala Arg Tyr Gly Met Thr
        115   120   125

Tyr Thr Gly Arg Ala Leu Asn Tyr Val Arg Lys Ala Ile Leu Pro Tyr
    130   135   140

Gly Arg Lys Asn Val Pro Lys Ala Leu Leu Leu Ile Thr Asp Gly Val
145   150   155   160

Ser Ser Asp Gly Ser Tyr Thr Ala Gln Val Ala Ala Met Leu Arg Asp
            165   170   175

Glu Gly Val Asn Val Met Val Ile Gly Val Gly Asp Val Asn Val Ala
            180   185   190

Glu Cys Arg Gly Ile Val Gly Cys Asp Gly Ile Met Asp Cys Pro Met
        195   200   205

Phe Lys Gln Thr Asn Trp Lys Asp Ile Met Gly Leu Phe Asn Ser Leu
    210   215   220

Met Lys Glu Val Cys Asp Ile Leu Pro Gln Asp Ala Val Cys Glu Pro
225   230   235   240

Val Trp Ala Glu Trp Ser Ser Cys Asn Gly Glu Cys Gly Val Pro Gly
            245   250   255

Lys Arg Thr Arg Ala Leu Leu Asp Leu Arg Met Ile Glu Lys Pro Val
        260   265   270

```
Asn Gly Ser Asn Gly Gln Pro Gly Lys Ser Cys Glu Asp Gln Lys Met
        275             280             285

Asn Phe Leu Pro Gln Ser Glu Thr Cys Thr Ile Glu Cys Asn His Glu
    290             295             300

Pro Val Pro Ser Ser Pro Glu Pro Val Ser Asp Asp Met Asp His Pro
305             310             315             320

Glu Pro Thr Pro Val Thr Pro Glu Gly Asp Met Asp Lys Ser His Ser
            325             330             335

His Ser Ser Ile Pro Ser Thr Pro Asp Met Pro Ser Ser His Ser Asp
        340             345             350

Met Ser Ser Ser Pro Thr Asp Met Ser Ser Ser Pro Thr Asp Met Ser
        355             360             365

Ser Ser Pro Thr Asp Met Ser Ser Ser His Ser Asp Met Pro Ser Thr
370             375             380

Pro Thr Gly Met Ser Ser Ser His Ser Asp Met Pro Ser Ser His Ser
385             390             395             400

Asp Met Pro Ser Ser His Ser Asp Met Ser Ser Ser Pro Thr Asp Met
            405             410             415

Ser Ser Ser His Ala Asp Thr Arg Val Gly Asn Thr Asp Glu Glu His
        420             425             430

Asn His Arg Lys Asp Met Asp Val Lys Phe Pro Glu Asn Met Asp Asp
        435             440             445

Ile Pro Val Glu Asp Asn Pro Ile Pro Thr Asp Pro Arg His Gly Val
    450             455             460

Glu Pro Ser Pro Ser Asp Val Ile Pro Glu Asp Asp Gln Leu Arg Arg
465             470             475             480

Thr Leu Glu Met Gln Arg Glu Glu Asp Leu Lys Lys Glu Leu Met Leu
            485             490             495

Gln His Glu Leu Lys Leu Gln Glu Glu Lys Glu Arg Ala Ala Ile Leu
        500             505             510

Glu Asn Asn Thr Pro Tyr Gly Ser Ala Thr Ser Val Ser Gln Asp Gly
```

```
Glu Ser Pro Thr Gly Val Pro Gln Ser Ser Glu Thr Asp Ala Ile Arg
    530             535             540

His Glu Val Tyr Asp Asp His Pro Glu Glu Ser Glu Asn Thr Gly Ile
545             550             555             560

Asn Ala Asp Val Thr Glu Ser Glu Asp Tyr Glu Gly Glu Lys Gln Lys
            565             570             575

Asp Glu Ser Asn Glu Arg Ser Thr Ser Asn Thr Thr Lys Ile Ala Gly
        580             585             590

Gly Ala Leu Leu Gly Leu Leu Leu Leu Gly Ala Gly Gly Gly Tyr Ala
        595             600             605

Met Tyr Lys Lys Asn Lys Thr Pro Thr Val Glu Thr Gly Ser Gly Asp
    610             615             620

Tyr Thr Gly Ala Asp Glu Ser Ser Glu Pro Met Lys Glu Gly Asp Thr
625             630             635             640

Tyr Thr Val Thr Glu Phe Asp Asn Asn Ile Trp Gly Glu Ala Ala
            645             650             655
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<212> DNA
<213> Theileria annulata

<220>
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<222> (1)..(1047)

<400> 7

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gat aag ggg cta tat cct gac ggt ata aag aaa ccg agc tcc tac tgc      48
Asp Lys Gly Leu Tyr Pro Asp Gly Ile Lys Lys Pro Ser Ser Tyr Cys
1               5               10              15

cac agg gaa ttg gac tta aca ata tta gtc gat gaa tcc tcg agt atc      96
His Arg Glu Leu Asp Leu Thr Ile Leu Val Asp Glu Ser Ser Ser Ile
            20              25              30

tat att gaa gag tgg aac aaa ctc att cca ttt ctt aaa tca ctg gtg     144
Tyr Ile Glu Glu Trp Asn Lys Leu Ile Pro Phe Leu Lys Ser Leu Val
        35              40              45

aga tca ata aat ata agt cca aat tat gtg cac ttg tca atg gtc acc     192
Arg Ser Ile Asn Ile Ser Pro Asn Tyr Val His Leu Ser Met Val Thr
    50              55              60

ttt tcc act tca att cgg tgg tta ata tca ttt ctc gac cca gcc tct     240
```
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```
         Phe Ser Thr Ser Ile Arg Trp Leu Ile Ser Phe Leu Asp Pro Ala Ser
         65              70              75              80

aag gat gag caa ttg gcc ctt gct gtt ctg gac aag ctg aag aac agt          288
Lys Asp Glu Gln Leu Ala Leu Ala Val Leu Asp Lys Leu Lys Asn Ser
                85              90              95

aag cct gtg ttt ggg tac aca ttc act gga cag gca ctt aac ttt att          336
Lys Pro Val Phe Gly Tyr Thr Phe Thr Gly Gln Ala Leu Asn Phe Ile
                100             105             110

tct gag gct gtt tat atg ttt ggt gct agg cgt aac tct cca aag ggc          384
Ser Glu Ala Val Tyr Met Phe Gly Ala Arg Arg Asn Ser Pro Lys Gly
        115             120             125

atc att atc atc acc gac gga tcc tct act cag aca aac gtt act tct          432
Ile Ile Ile Ile Thr Asp Gly Ser Ser Thr Gln Thr Asn Val Thr Ser
        130             135             140

cag gcg tcg gct cta cta agg gat gct ggt gta aca att cta gtt gtt          480
Gln Ala Ser Ala Leu Leu Arg Asp Ala Gly Val Thr Ile Leu Val Val
145             150             155             160

gga gtt ggg aag gct aaa gaa agc gag tgt aga ggt ata gtt ggt tgt          528
Gly Val Gly Lys Ala Lys Glu Ser Glu Cys Arg Gly Ile Val Gly Cys
                165             170             175

tct acc aaa gga gag tgc ccc ctt ttc ttt atg acc aac tgg gat gaa          576
Ser Thr Lys Gly Glu Cys Pro Leu Phe Phe Met Thr Asn Trp Asp Glu
                180             185             190

att atc agg aag gtt ggg gag ttg atg gct gag gtt tgt gag acc att          624
Ile Ile Arg Lys Val Gly Glu Leu Met Ala Glu Val Cys Glu Thr Ile
        195             200             205

cct aag gac gcc gta tgt aag ccg atc tgg tct gat tgg tct aag tgt          672
Pro Lys Asp Ala Val Cys Lys Pro Ile Trp Ser Asp Trp Ser Lys Cys
        210             215             220

gac gcc aag tgc ggc att ggg acg agg tac caa aag ttg atg gga gtt          720
Asp Ala Lys Cys Gly Ile Gly Thr Arg Tyr Gln Lys Leu Met Gly Val
225             230             235             240

act aca att tct gag cca act gtc gga acg aac ggc aag tcc ggg agg          768
Thr Thr Ile Ser Glu Pro Thr Val Gly Thr Asn Gly Lys Ser Gly Arg
                245             250             255

aca tgt gag atg att tat gag aac gtc gag gtt cca aag gag gag tgc          816
Thr Cys Glu Met Ile Tyr Glu Asn Val Glu Val Pro Lys Glu Glu Cys
                260             265             270

tcc gtt gag tct aag att gct gga gga gtg gct cta gca ctg tta atg          864
Ser Val Glu Ser Lys Ile Ala Gly Gly Val Ala Leu Ala Leu Leu Met
                275             280             285

ctt gca ggc gga ggt ggt tac aca tac tac aaa aag tac ggt tta tct          912
Leu Ala Gly Gly Gly Gly Tyr Thr Tyr Tyr Lys Lys Tyr Gly Leu Ser
        290             295             300

aga gtg agt gaa act acg aat ttg gat gag gat ttt gca gat tct agt          960
Arg Val Ser Glu Thr Thr Asn Leu Asp Glu Asp Phe Ala Asp Ser Ser
305             310             315             320
```

```
ggg aac cgt ggt gta agg gag agt gtg ggt gaa gct tac aca gta act     1008
Gly Asn Arg Gly Val Arg Glu Ser Val Gly Glu Ala Tyr Thr Val Thr
            325                     330                 335

gat tta gat gat gga ctc tgg agc caa tcc aat caa taa               1047
Asp Leu Asp Asp Gly Leu Trp Ser Gln Ser Asn Gln
            340                 345
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<210> 8
<211> 348
<212> PRT
<213> Theileria annulata

<400> 8

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Asp Lys Gly Leu Tyr Pro Asp Gly Ile Lys Lys Pro Ser Ser Tyr Cys
1               5               10                  15


His Arg Glu Leu Asp Leu Thr Ile Leu Val Asp Glu Ser Ser Ser Ile
            20                  25                  30


Tyr Ile Glu Glu Trp Asn Lys Leu Ile Pro Phe Leu Lys Ser Leu Val
        35                  40                  45


Arg Ser Ile Asn Ile Ser Pro Asn Tyr Val His Leu Ser Met Val Thr
    50                  55                  60


Phe Ser Thr Ser Ile Arg Trp Leu Ile Ser Phe Leu Asp Pro Ala Ser
65                  70                  75                  80


Lys Asp Glu Gln Leu Ala Leu Ala Val Leu Asp Lys Leu Lys Asn Ser
                85                  90                  95


Lys Pro Val Phe Gly Tyr Thr Phe Thr Gly Gln Ala Leu Asn Phe Ile
            100                 105                 110


Ser Glu Ala Val Tyr Met Phe Gly Ala Arg Arg Asn Ser Pro Lys Gly
            115                 120                 125


Ile Ile Ile Ile Thr Asp Gly Ser Ser Thr Gln Thr Asn Val Thr Ser
    130                 135                 140


Gln Ala Ser Ala Leu Leu Arg Asp Ala Gly Val Thr Ile Leu Val Val
145                 150                 155                 160


Gly Val Gly Lys Ala Lys Glu Ser Glu Cys Arg Gly Ile Val Gly Cys
                165                 170                 175


Ser Thr Lys Gly Glu Cys Pro Leu Phe Phe Met Thr Asn Trp Asp Glu
            180                 185                 190
```

```
Ile Ile Arg Lys Val Gly Glu Leu Met Ala Glu Val Cys Glu Thr Ile
        195             200                 205

Pro Lys Asp Ala Val Cys Lys Pro Ile Trp Ser Asp Trp Ser Lys Cys
    210             215             220

Asp Ala Lys Cys Gly Ile Gly Thr Arg Tyr Gln Lys Leu Met Gly Val
225             230                 235                     240

Thr Thr Ile Ser Glu Pro Thr Val Gly Thr Asn Gly Lys Ser Gly Arg
                245             250                 255

Thr Cys Glu Met Ile Tyr Glu Asn Val Glu Val Pro Lys Glu Glu Cys
            260                 265                 270

Ser Val Glu Ser Lys Ile Ala Gly Gly Val Ala Leu Ala Leu Leu Met
        275                 280                 285

Leu Ala Gly Gly Gly Gly Tyr Thr Tyr Tyr Lys Lys Tyr Gly Leu Ser
    290                 295                 300

Arg Val Ser Glu Thr Thr Asn Leu Asp Glu Asp Phe Ala Asp Ser Ser
305                 310                 315                 320

Gly Asn Arg Gly Val Arg Glu Ser Val Gly Glu Ala Tyr Thr Val Thr
                325                 330                 335

Asp Leu Asp Asp Gly Leu Trp Ser Gln Ser Asn Gln
            340                 345
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<210>  9
<211>  2259
<212>  DNA
<213>  Babesia bovis

<220>
<221>  CDS
<222>  (552)..(2189)

<220>
<221>  misc_feature
<222>  (1465)..(1465)
<223>  The 'r' at location 1465 stands for g or a

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ataagatgta gcactgatgt gtgtactcgg actctgacac tggagtatag gctaccagaa      60

ctgggcgcaa ctccctaatg gagtgccgct cccaggaggc cacagaacaa tggagtacaa     120

cgctcaaaac cgcagtgaat gttagctaca atatgtacat attgtcatgg agttcgtaat     180
```

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cctaacaaag gccattgtat cgtcaatgtg gtctaccagt ggacgtcgct tgtggaggcc    240

agggtacatc aaatccctga gaacacctat cgtccggtgt tacggtggta atgggttact    300

ataaaagcaa atttaattgt agatattgta aaaaaactgt aaaattggtt agtgcttgca    360

ccgtcctggt cccgcgattt ggataccgct gtgctacgct ttgcacggaa tcacgacgtc    420

gtgcataacg ctgtgcttat gacttcgtac acatcaaacg actttaactg ccgttggttt    480

atatacgttg gcgttaggtt gttttgggtg ttattgtact gtggaatcat acacattcta    540

cacgtgtcat g atg gtg aag ttc cac aca tta tcg gtt gca gcc atc ctg    590
            Met Val Lys Phe His Thr Leu Ser Val Ala Ala Ile Leu
            1               5                   10
```
```
gcg att gct tca tcc aat act att ttt gct aca ttt aga tca aat gga    638
Ala Ile Ala Ser Ser Asn Thr Ile Phe Ala Thr Phe Arg Ser Asn Gly
    15                  20                  25
```
```
aaa acc ttc gga gat gaa tct gtt agc ctt cta gaa cat gaa agt acc    686
Lys Thr Phe Gly Asp Glu Ser Val Ser Leu Leu Glu His Glu Ser Thr
30                  35                  40                  45
```
```
agt ttg tct cgt ggt cct aga cca acc gaa gat caa atc agt cag tta    734
Ser Leu Ser Arg Gly Pro Arg Pro Thr Glu Asp Gln Ile Ser Gln Leu
                50                  55                  60
```
```
cca aaa aat gtt ttc ttt cta ttg gat aac agc att gat atg tct att    782
Pro Lys Asn Val Phe Phe Leu Leu Asp Asn Ser Ile Asp Met Ser Ile
                65                  70                  75
```
```
gaa act gga gaa gag aat cgt cat ttc ctc tcc gag ttt ttt aaa ttg    830
Glu Thr Gly Glu Glu Asn Arg His Phe Leu Ser Glu Phe Phe Lys Leu
        80                  85                  90
```
```
tta aaa aaa tat gaa gga ata aat gtt tca cta ata agg tac aat agt    878
Leu Lys Lys Tyr Glu Gly Ile Asn Val Ser Leu Ile Arg Tyr Asn Ser
    95                  100                 105
```
```
gaa gaa ccg tta ggt tcg acg aaa gca tta acc aac ggg gag ttg aaa    926
Glu Glu Pro Leu Gly Ser Thr Lys Ala Leu Thr Asn Gly Glu Leu Lys
110                 115                 120                 125
```
```
aaa cta tcc gat aat att cct act aaa atg cct ttt gac att ggc gtt    974
Lys Leu Ser Asp Asn Ile Pro Thr Lys Met Pro Phe Asp Ile Gly Val
                130                 135                 140
```
```
gtt cct act ggt ata gga gct gcc ctc aaa cag ata aaa aca ttg tac   1022
Val Pro Thr Gly Ile Gly Ala Ala Leu Lys Gln Ile Lys Thr Leu Tyr
                145                 150                 155
```
```
cct gat cac gaa aag ttc ctt gtt ggg aac acc att act gag ttg gat   1070
Pro Asp His Glu Lys Phe Leu Val Gly Asn Thr Ile Thr Glu Leu Asp
        160                 165                 170
```
```
tat tct aaa gca ttg ggt aag gat att gtt gta atc gtg ttt act act   1118
Tyr Ser Lys Ala Leu Gly Lys Asp Ile Val Val Ile Val Phe Thr Thr
    175                 180                 185
```
```
ggc cac gtc att gat cca tat tta gca tat gat gag gca ttt gat gcc   1166
Gly His Val Ile Asp Pro Tyr Leu Ala Tyr Asp Glu Ala Phe Asp Ala
190                 195                 200                 205
```

```
cgc cgt aat ggt gta aga ttt tac gtt att aat agg gga gga aag gca      1214
Arg Arg Asn Gly Val Arg Phe Tyr Val Ile Asn Arg Gly Gly Lys Ala
            210                 215                 220

aaa aac tat tgg act cag cta ttg gga tgc cac tac aat act tgt ttg      1262
Lys Asn Tyr Trp Thr Gln Leu Leu Gly Cys His Tyr Asn Thr Cys Leu
            225                 230                 235

agt tat att cgg gcc aaa ata aca agg cct tca cta tat ctc gat gtt      1310
Ser Tyr Ile Arg Ala Lys Ile Thr Arg Pro Ser Leu Tyr Leu Asp Val
            240                 245                 250

ttg gtg aac agg att gtg tct aaa cgc gcg aaa gat gcc gtt tgt ttg      1358
Leu Val Asn Arg Ile Val Ser Lys Arg Ala Lys Asp Ala Val Cys Leu
            255                 260                 265

gaa gtg tgg acg gat tat aaa cct aac act gaa aaa tcg gat gtg agg      1406
Glu Val Trp Thr Asp Tyr Lys Pro Asn Thr Glu Lys Ser Asp Val Arg
270                 275                 280                 285

att atg act tct acg ttg aaa tta tac aaa acc ctt ctt act gga agc      1454
Ile Met Thr Ser Thr Leu Lys Leu Tyr Lys Thr Leu Leu Thr Gly Ser
            290                 295                 300

ttt gcg gag ara aac atc aaa ggt ctc aca tgt gat gag cag cta aag      1502
Phe Ala Glu Xaa Asn Ile Lys Gly Leu Thr Cys Asp Glu Gln Leu Lys
            305                 310                 315

gat atg cag aaa aga caa ata ttt tgc tac tca aat aag tgt gct ccc      1550
Asp Met Gln Lys Arg Gln Ile Phe Cys Tyr Ser Asn Lys Cys Ala Pro
            320                 325                 330

acg atc tat tca aga tct tat gtt gac tta gct att caa cgt ctt aat      1598
Thr Ile Tyr Ser Arg Ser Tyr Val Asp Leu Ala Ile Gln Arg Leu Asn
            335                 340                 345

gca aaa gat ttt aaa gag gta cta gat gag tca tct tac aga tca cgc      1646
Ala Lys Asp Phe Lys Glu Val Leu Asp Glu Ser Ser Tyr Arg Ser Arg
350                 355                 360                 365

agt ttg caa tca gtg gag aaa cat aat gag caa caa aca ggt tct caa      1694
Ser Leu Gln Ser Val Glu Lys His Asn Glu Gln Gln Thr Gly Ser Gln
            370                 375                 380

gaa acg ctt tct gga agc gcc cgt gta gaa aca agc tta gaa agc tca      1742
Glu Thr Leu Ser Gly Ser Ala Arg Val Glu Thr Ser Leu Glu Ser Ser
            385                 390                 395

gta cct tca tcc tat gtg gca gaa ttg gga gaa agt gat aca gaa aca      1790
Val Pro Ser Ser Tyr Val Ala Glu Leu Gly Glu Ser Asp Thr Glu Thr
            400                 405                 410

tac aaa cag ttg gag tac ata gat aaa aat ggc gtc act gtc ttc aac      1838
Tyr Lys Gln Leu Glu Tyr Ile Asp Lys Asn Gly Val Thr Val Phe Asn
            415                 420                 425

gat gag ccc act gtt gtt gtc gat act ccc gag tac gta caa aag gtg      1886
Asp Glu Pro Thr Val Val Val Asp Thr Pro Glu Tyr Val Gln Lys Val
430                 435                 440                 445

cat gaa aga gaa atg cag ttt gat gaa gaa tcc acc cat ctt ccc aac      1934
His Glu Arg Glu Met Gln Phe Asp Glu Glu Ser Thr His Leu Pro Asn
```

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                          Substitute Sequence Listing
             450                      455                    460
tct ggt aac cac cat cca cct cat cac cga aag ggg gcc aac gga tcc       1982
Ser Gly Asn His His Pro Pro His His Arg Lys Gly Ala Asn Gly Ser
                465                      470                    475

ggt aaa aag acc acg atc gtc gtt ggt att ata tgc ctt gta gta ata       2030
Gly Lys Lys Thr Thr Ile Val Val Gly Ile Ile Cys Leu Val Val Ile
            480                      485                    490

tgc gcc gtc ata gcc ggc gcc tac cta tcc ctt tca cag caa gag tct       2078
Cys Ala Val Ile Ala Gly Ala Tyr Leu Ser Leu Ser Gln Gln Glu Ser
        495                      500                    505

gtg gaa ctc acc tct gaa gag ggt gac ttc ttg aac gac act acg ggt       2126
Val Glu Leu Thr Ser Glu Glu Gly Asp Phe Leu Asn Asp Thr Thr Gly
510                      515                      520                    525

ggt caa cct gag gta ctc gaa aca caa cag gtt gtg gat gca gag aac       2174
Gly Gln Pro Glu Val Leu Glu Thr Gln Gln Val Val Asp Ala Glu Asn
                530                      535                    540

aaa aca tgg ttg taa gacacgaaac gggttgtcac agccaacata tacaaatgca       2229
Lys Thr Trp Leu
                545

gtttaaatta agtcactagt taaaaaaaaa                                       2259


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<213>  Babesia bovis

<220>
<221>  misc_feature
<222>  (305)..(305)
<223>  The 'Xaa' at location 305 stands for Arg, or Lys.

<400>  10

Met Val Lys Phe His Thr Leu Ser Val Ala Ala Ile Leu Ala Ile Ala
1               5                   10                  15


Ser Ser Asn Thr Ile Phe Ala Thr Phe Arg Ser Asn Gly Lys Thr Phe
            20                  25                  30


Gly Asp Glu Ser Val Ser Leu Leu Glu His Glu Ser Thr Ser Leu Ser
        35                  40                  45


Arg Gly Pro Arg Pro Thr Glu Asp Gln Ile Ser Gln Leu Pro Lys Asn
    50                  55                  60


Val Phe Phe Leu Leu Asp Asn Ser Ile Asp Met Ser Ile Glu Thr Gly
65                  70                  75                  80


Glu Glu Asn Arg His Phe Leu Ser Glu Phe Phe Lys Leu Leu Lys Lys
                85                  90                  95
```

Tyr Glu Gly Ile Asn Val Ser Leu Ile Arg Tyr Asn Ser Glu Glu Pro
        100   105   110

Leu Gly Ser Thr Lys Ala Leu Thr Asn Gly Glu Leu Lys Lys Leu Ser
        115   120   125

Asp Asn Ile Pro Thr Lys Met Pro Phe Asp Ile Gly Val Val Pro Thr
  130   135   140

Gly Ile Gly Ala Ala Leu Lys Gln Ile Lys Thr Leu Tyr Pro Asp His
145   150   155   160

Glu Lys Phe Leu Val Gly Asn Thr Ile Thr Glu Leu Asp Tyr Ser Lys
        165   170   175

Ala Leu Gly Lys Asp Ile Val Val Ile Val Phe Thr Thr Gly His Val
        180   185   190

Ile Asp Pro Tyr Leu Ala Tyr Asp Glu Ala Phe Asp Ala Arg Arg Asn
        195   200   205

Gly Val Arg Phe Tyr Val Ile Asn Arg Gly Gly Lys Ala Lys Asn Tyr
  210   215   220

Trp Thr Gln Leu Leu Gly Cys His Tyr Asn Thr Cys Leu Ser Tyr Ile
225   230   235   240

Arg Ala Lys Ile Thr Arg Pro Ser Leu Tyr Leu Asp Val Leu Val Asn
        245   250   255

Arg Ile Val Ser Lys Arg Ala Lys Asp Ala Val Cys Leu Glu Val Trp
        260   265   270

Thr Asp Tyr Lys Pro Asn Thr Glu Lys Ser Asp Val Arg Ile Met Thr
        275   280   285

Ser Thr Leu Lys Leu Tyr Lys Thr Leu Leu Thr Gly Ser Phe Ala Glu
  290   295   300

Xaa Asn Ile Lys Gly Leu Thr Cys Asp Glu Gln Leu Lys Asp Met Gln
305   310   315   320

Lys Arg Gln Ile Phe Cys Tyr Ser Asn Lys Cys Ala Pro Thr Ile Tyr
        325   330   335

Ser Arg Ser Tyr Val Asp Leu Ala Ile Gln Arg Leu Asn Ala Lys Asp

Phe Lys Glu Val Leu Asp Glu Ser Ser Tyr Arg Ser Arg Ser Leu Gln
        355   360   365

Ser Val Glu Lys His Asn Glu Gln Gln Thr Gly Ser Gln Glu Thr Leu
    370   375   380

Ser Gly Ser Ala Arg Val Glu Thr Ser Leu Glu Ser Ser Val Pro Ser
385   390   395   400

Ser Tyr Val Ala Glu Leu Gly Glu Ser Asp Thr Glu Thr Tyr Lys Gln
            405   410   415

Leu Glu Tyr Ile Asp Lys Asn Gly Val Thr Val Phe Asn Asp Glu Pro
            420   425   430

Thr Val Val Val Asp Thr Pro Glu Tyr Val Gln Lys Val His Glu Arg
        435   440   445

Glu Met Gln Phe Asp Glu Glu Ser Thr His Leu Pro Asn Ser Gly Asn
    450   455   460

His His Pro Pro His His Arg Lys Gly Ala Asn Gly Ser Gly Lys Lys
465   470   475   480

Thr Thr Ile Val Val Gly Ile Ile Cys Leu Val Val Ile Cys Ala Val
            485   490   495

Ile Ala Gly Ala Tyr Leu Ser Leu Ser Gln Gln Glu Ser Val Glu Leu
        500   505   510

Thr Ser Glu Glu Gly Asp Phe Leu Asn Asp Thr Thr Gly Gly Gln Pro
    515   520   525

Glu Val Leu Glu Thr Gln Gln Val Val Asp Ala Glu Asn Lys Thr Trp
    530   535   540

Leu
545

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caaaaggata cctatatttg gtac                                            24


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gggaagcttc tgagcaaagg aaatagg                                         27
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cccgtcgact gcctcgcccc aaatgttgt                                          29


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